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ABSTRACT

Data administration (DA) is a position that has emerged with the growth of information technologies. A review of DA literature confirms that, although DA is widely associated with database management systems (DBMS), there is no standard DA job description, DA staffing and location within the organization vary, and DA functions range in description from highly technical to highly administrative. The Data Administration Office at Northern Arizona University (NAU) provides an example of the evolution of DA. Established subsequent to the university's conversion to a new computer system in the fall of 1984, the office began as a one-person operation concerned primarily with data integrity and policy development. Now its activities include the documentation and standardization of procedures, policy development, and logical database design. Based on the NAU case study, it is possible to make generalized observations concerning the creation of DA subsequent to system installation; the bearing of organizational structure and politics on DA; public-sector commitment to data as a centralized resource; the relationship of data accountability to accuracy; successful DBMS implementation; and potential increases in DBMS data integrity problems. Sixteen references are provided, and draft copies of NAU Computer and Data-Related Policies and the NAU Data Access and Use Agreement are appended. (KM)

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DATA ADMINISTRATION AT A REGIONAL UNIVERSITY: A CASE STUDY

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DATA ADMINISTRATION AT A REGIONAL UNIVERSITY: A CASE STUDY

Abstract

This paper traces the evolution of Data Administration through a literature review. The lack of common agreement on job description, responsibilities, role and placement within the organization is documented.

The work of one Data Administration office at a university is described, preceded by the background that occasioned it. Activities unique to the particular environment are described and future activities are suggested.

Finally, observations are made regarding Data Administration, which is seen as expanding with diverse total responsibilities, uniquely defined within each organization and strongly influenced by organizational politics and structure. Indicators for success as well as failure are discussed. Observations are intended to be generalizable to theoretical propositions, not populations.

INTRODUCTION

Data Administration (DA) is a position that has emerged with the growth of information technologies. Although widely found associated with data base management systems (DBMS), job responsibilities, staffing, reporting structure and perceptions of success differ greatly. The same may be said of institutional research offices. This paper will review the evolution of Data Administration through a literature review, describe one Data Administration office in a university and conclude with some observations about the position.

REVIEW OF LITERATURE

Claims about the importance of data administration and its role in information processing have been made for more than a decade (11, 12). Of the literature reviewed, no two sources were consistent with exact job descriptions; however, all claimed the importance of the position and advocated high placement within the organization. Usually, references were made to the use of the data dictionary as a tool.

Nerad saw data administration as a Computer Center job: one designed to assist programmers and analysts with data definition, uniqueness standards and enforcement through the use of a data dictionary (12, pp. 26-27). The benefit of this approach would be a disciplined computer organization with enforceable standards, minimal redundancy, accurate documentation and central control (12, pg. 31).

Managing data as a resource was the focus of an article in 1976 by Minami (11). The Data Administration function was defined as including "...development and coordination of the policies, procedures, practices and plans for the capture, correction, storage, and use of data" and serving "...the entire line organization to improve the quality of data for decisions, to provide more cost effective data handling, and to support long-range planning processes" (11, pg. 41). Database Administration (DBA), Data Operations and Data Services were described as part of Data Administration. A prerequisite to the establishment of a Data Administration function was a management agreement that data was a resource similar to raw materials or equipment (11, pg. 43).

As DBMS have proliferated, debate has continued with regard to the definitions of DA and DBA. Most references discuss both functions and define their responsibilities and relationships. Tillmann (15) specifically wrote about these two functions. He noted that with the advent of DBMS the DBA was created to maintain and monitor the software. In so doing, it became apparent the technical work of maintaining all of the DBMS software was a struggle and that managerial responsibilities of interfacing with users was a casualty. He claimed that the DA position was created to compliment the DBA, "...incorporating the qualities not filled be the DBA's technical nature (15, pg. 98). While he acknowledged similarities and overlap in functions, he listed responsibilities of each:

Data Base Administrator's Duties:

1. Maintain DBMS software
2. Design physical data base
3. Compile schemas and subschemas
4. Support data base TP monitor
5. Provide and monitor data base security
6. Enforce data base standards
7. Provide and manage access to the data base
8. Contribute to data base short range planning
9. Monitor and maintain data base integrity
10. Support application system designers that use the DBMS (15, pg. 98).

Data Administrator's Duties:

1. Logical data base design
2. Naming conventions
3. Data dictionary standards
4. Data base consulting
5. Data base standards
6. Physical data base design
7. Enterprise surveys
8. Data base long range planning
9. Data base project costing and planning
10. Security standards and guidelines
11. Educating users and potential users in data base technology and use
12. Train users in data base and DBMS techniques
13. Encourage data base proliferation
14. Control data base expansion
15. Maintain corporate goals in DBMS usage
16. Provide supportive atmosphere for users (15, pg. 100).

Tillmann went on to discuss pros and cons to various organizational relationships, although he finally concluded that the DBA should report to the DA. The DA should report to a higher authority. Using the data dictionary as a tool of DA was emphasized.

Kevin Hunt defined DA as consisting of two major subfunctions, data management and DBA, which he described as follows: "Data management is a consulting, planning and control function. Data base administration is responsible for the day-to-day operational and analytical activities" (9, pg. 36). He cited a number of responsibilities of data management. Some of these responsibilities were liaison with users and analysts, long range planning, designing the logical data base, privacy/security, standards setting and documentation. Similarly, he defined responsibilities of the DBA as being technical in nature and including schema generation, performance tuning, data dictionary operations, backup/recovery and physical data base design (9, pg. 37-39). Hunt acknowledged that the DA function had no standard location within an organization.

Durell (5) wrote at length about Data Administration in his efforts to create a guide for data management. He too conceded an identity

problem for DA even among people experienced in data processing. He categorized typical responses from programmers and analysts regarding DA as having to do with data dictionaries and data bases (5, pg. 3).

Durell's definitions of DA and DBA were straight forward. DA should define the contents and boundaries of the database(s). A logical model of the database should be designed by the DA to be later implemented in physical form by the DBA. The DA should plan and coordinate the construction of databases. A business systems plan for data usage throughout the organization should be developed. The DBA should work with the physical database and should be responsible for its design, implementation, security and maintenance (5, pg. 5).

A number of benefits associated with DA were claimed by Durell. One benefit concerned the central control and management of data definitions. Another benefit concerned data design expertise, focused primarily on logical design. Still another concerned effective sharing and coordination of information within the organization. Finally, sharing data about data (metadata) contained in a data dictionary was viewed as a major benefit of DA (5, pp. 15-17).

Durell wrote a word of warning about the proliferation of microcomputers. Among the problems noted were lack of information security, untrained users performing programming tasks, lack of control on individual applications, lack of hardware and software compatibility and lack of backup support (5, pp. 167-68). While it would be virtually impossible for DA to control the creation and transfer of this corporate information, Durell believed that central corporate data should be promoted.

Another lengthy text was also devoted to DA. Brathwaite defined functions and activities of DA and DBA, not unlike other authors (4, pp. 15-20). DA functions concerned logical database design, liaison to and training of personnel in DA concepts, setting and monitoring logical and physical database design, use of data dictionaries for documentation, promotion of data sharing, resolving data sharing conflicts, policy formulation and database auditing and monitoring. DBA functions concerned physical database design, DBMS software and hardware acquisition, DBMS performance and capacity monitoring, security and test facilities.

Brathwaite acknowledged the positioning of DA within the organization to be a topic of debate: some people favor its location within the Management Information System (MIS) structure and others favor its location outside. His preference was for DA to be located outside of MIS and on a level comparable to Finance, Personnel, Marketing and Production (4, pg. 17).

Brathwaite believed data to be a corporate resource and that ownership should rest with the corporate entity. Functional responsibility for data input and maintenance should be transferred to functional users or departments (4, pg. 10). Data integrity, seen as essential, was defined as "...a measure of the quality and reliability of the data on

which computer-based information systems depend" (4, pg. 8). Corrupted data may reside on a system for many reasons: data entry or formatting errors, faulty conversion or transcription, data that is lost, forgotten or delayed, deliberately falsified or omitted data and faithful representation of an illegal or impossible event. Brathwaite advocated the creation of a user group to arbitrate data sharing conflicts (4, pg. 104).

The notion of data as a corporate resource as well as DA being involved in its management, planning and documentation was the theme of an article by Holloway (8). DA was defined as "... the corporate service which assists the provision of information systems by controlling and/or coordinating the definitions (format and characteristics) and usage of reliable and relevant data" while DBA "...provides technical support for data administration by: performing database design and development, being responsible for organizing and defining the logical view of data, providing education on database technology, and providing support to users in operational database-related activities" (8, pg. 196).

Holloway stated that the need for DA was occasioned by problems in collecting, holding and processing operational data and providing management information. Specifically, some problems were defined as follows: information provided too late to be useful, conflicting information from different sources, inconsistent information, differences in definitions and procedures, proliferation of cheap local systems with hidden long-term costs and difficulties in sharing data in light of internal conflicts and absence of established priorities (8, pg. 196).

As with other references cited, no attempt was made to presume standard responsibilities for DA within the industry. "The responsibilities of the data administration will vary from company to company" (8, pg. 197). Certain factors that would affect DA responsibilities were defined as: company structure complexity, centralization and decentralization policy, DBMS system, system inconsistencies, data protection legislation and corporate business plans. Holloway noted, however, that in a centralized company, DA would control data activities, while in a decentralized company, DA would advise and liaise on data activities (8, pg. 197).

Lacob referred to DA as "...a relatively new information management position that is developing in response to the growing importance corporations ascribe to their data" (10, pg. 50). He also argued that no clear definition of DA exists in the corporate structure and that management must understand that DA is different from DBA. Lacob defined each DBA as being responsible for a single database, having narrowly defined scope, working with programmers and analysts to ensure data security and integrity, and being immersed in the technicalities of the database. Conversely, the DA's scope was defined as more global with responsibilities for data relationships between many databases

(10, pg. 50). The key tool for the DA was seen as the data dictionary which should contain element definitions, relationships between and among elements and paths taken by data to the users.

Three articles included in the review of literature specifically referenced survey research targeted toward Data Administration (6, 13, 16). Findings from these sources were consistent with the picture painted by preceding references, i.e., no standard job description or set of responsibilities, organization or reporting structure, etc. Additional information, however, was presented. For example, some common problems experienced by Data Administrators were defined as excessive workload, lack of resources, responsibilities without authority, resistance by other departments to change and changing job responsibilities, resistance by others to data sharing and lack of management support (6, 16).

Size of DA groups varied greatly. Some consisted of only one person; some were staffed with as many as seventy-five people (16, pg. 72). The integrated database environment was defined as "...fraught with politics, resistance to change, and other parochial concerns..." (16, pg. 73). Gillenson stated that "It is clear that any implementation of the concept of Data Administration must be tailored to the technical and political realities of the individual firm" and "...the successful DA departments tended to be larger, older, have more responsibilities, be associated with higher daily database transactions rates and have fewer complaints" (6, pg. 319). Many Data Administrators expressed dissatisfaction with their effectiveness. Organizational problems presented constant hassles, DAs were often given responsibilities without concomitant authority, and administrative tasks involving people, politics and trade-offs were seen as difficult to accomplish (16, pg. 74). In reporting on a survey done by Beverly Kahn, Lois Paul related that respondents claimed they were not effective in promoting data sharing, nor in controlling data redundancy (13, pg. 8).

SUMMARY OF LITERATURE REVIEW

The review of literature on Data Administration confirms that there is no standard or generally accepted job description. DA staffing ranges from one to seventy-five. Location within the organization also varies greatly. Sometimes DA is located inside of MIS and sometimes it is not. Sometimes DBA reports to DA and sometimes it does not or DA reports to DBA. DA functions vary in description from a highly technical role to a highly administrative role.

Some common themes emerged, however. Almost all references to DA included the use of a data dictionary as a tool. Its use served the purposes of data definition, standardization, mapping to programs and systems, etc. Virtually all references presumed or advocated the role and contribution of DA in the design stages of a system. No references discussed, at any length, the notion of the consequences of creating a DA function after a DBMS was operational. Finally, recent references tended to discuss the notion of data as a resource and the need for its

management just as is the case with any other corporate resource. DA responsibilities were inclusive of that form of management.

EVOLUTION OF DATA ADMINISTRATION AT NORTHERN ARIZONA UNIVERSITY (NAU)

In the fall of 1984 NAU converted to a new computer to support all administrative applications and one academic application. The system consisted of an IBM 3083 and a Student Information System (SIS) developed and acquired from a sister institution. SIS ran on the Cullinet IDMS database. SIS did not include Financial, Housing or Personnel components; although, interfaces to them existed in various states of functionality for NAU. Those other systems, some in states of early development or enhancement were migrated to the IBM from the previous mainframe and their structures were not of the database design. Since the conversion in 1984, Housing and Financial Aid have evolved into IDMS database applications. Development continues on them.

Academic computing remained largely unaffected by the administrative conversion. Academic mainframe computing remained on a separate machine. Micro applications and use of the micro as a teaching tool were flourishing, a phenomenon that continues.

Mainframe computing for the College of Business Administration (CBA) migrated to the IBM and to micros. Previous mainframe computing for CBA had been on a machine similar to the one that preceded the IBM for administrative applications. Academic computing by-in-large has been beyond the scope of DA responsibilities at NAU and will be discussed only briefly later in this paper.

Typical of most conversions, problems presented themselves immediately. Not all of the problems will be addressed in this paper, only those that bear on the work of DA. Probably the principal conversion problem was the result of differences in institutional policies. The policies of our sister institution where reflected in the code. It was important, however, that NAU policies be reflected in the code. The result was that the implemented code was never stabilized and it continues to evolve and suffer from logic that never was intended for NAU.

Next, and typical of much production software, SIS suffered from limited editing capability. Data in many fields were not subject to editing. When data entry screens required an entry, data entry personnel sometimes simply entered something that they knew would work whether it was accurate or not.

Part of the agreement of conversion was that NAU administrative users would be responsible for the data, Computer Services would not. Computer Services would see to it that fields existed for the data and would assist in transporting data from the previous mainframe to the IBM, but basic input of new data and ongoing data maintenance would be the responsibility of the user, i.e., the Registrar, Admissions, etc.

The result of this agreement was that Computer Services did not have responsibility for data integrity.

Some users also viewed data and programmers as their own. Programmers' work was influenced greatly by the user offices they supported. Many user offices have been slow to adopt an institutional view of data and its use. Certainly, most user offices do not have the luxury of being overstaffed. However, there has been a reluctance to request more staff to improve data integrity.

Problems also existed when data requests were made of one user by another user. Occasionally, requests were sent to Computer Services and were granted. Usually, requests were sent to the users that "owned" the data or were forwarded by Computer Services to those users. Responses to those requests varied greatly in terms of timeliness, ease of access and requestor satisfaction.

Around the time of conversion, an office of Institutional Studies (now called Institutional Research) was evolving. Not an "owner" of any data, but responsible for much analysis and reporting of data, this office's work quickly demonstrated problems with data integrity and "owner" approval to access data.

In the summer of 1985, a study of data problems was undertaken which resulted in a memo addressed to the Associate Vice President for Administration and Finance and to the Director of Computer Services (7). The study identified the following five major issues: correcting bad data when encountered, keeping bad data from being entered, access to the database for Institutional Studies, need for better documentation of software, data, responsible users, access, etc., and, finally, the need for an office responsible for the functions described in previous issues. In December of 1985, the Vice President for Administration and Finance released a memo that announced the establishment of a Data Administration office (3). That memo and another released in March of 1986 (2) defined the scope of issues to be addressed by DA. Among them were the following :

- data entry problems
- lack of a common listing of data codes
- correcting "bad data" on the system
- improved editing of data
- lack of timely, accurate data
- "turf" concerns about ownership and responsibility for reports
- coordinated records management (updating, maintenance, purging, privacy, etc.).
- effective communication
- access methods to data and tools for access
- micro access to the mainframe
- user development of software
- channeling of information requests.

These memos did not attempt to define all problems, just those that had received high visibility. The major users of SIS, Computer Services

and the Data Administrator were brought together to discuss and address the problems. No presumption was made as to the ease of addressing known problems, nor the length of time necessary to develop solutions for them. The Data Administration office was a one-person office, staffed by a person who had previous experience in Computer Services and Institutional Research. The office reported to the Associate Vice President for Administration and Finance, to whom Computer Services and Institutional Studies also reported.

FOCUS OF DATA ADMINISTRATION EFFORTS:

Initially, in the spring and summer of 1986, a number of meetings were called by the Data Administrator to discuss issues in two primary areas: data integrity and policy development. These meetings were attended by representatives of the primary SIS users and Computer Services.

Data integrity problems could be characterized by the following examples: invalid birthdate, ethnicity or sex data, inconsistent or inaccurate academic levels relative to other data, inconsistent previous or foreign institution transfer data, inconsistent reporting from the database due to improper record connections or record relationships, user screens that reported/computed the same data in different ways, confusion about the relevant application from a student when more than one had been submitted, and more bad data or relationships created from attempts to clean or "sweep" the database. Meetings in which these and other problems were discussed were not looked upon with great enthusiasm because of heavy work loads, anticipation of blame or criticism, and often simple differences of opinion about the importance of addressing some of the issues.

Generally, university users have cooperated in addressing data integrity problems. Usually, more support has been directed toward cleaning existing bad data manually than toward improving editing capability. Computer Services' work load is viewed as critical and overloaded; hence, users are not enthusiastic in their support of additional software work requests that they , themselves, have not initiated. Much of this kind of cleanup work is associated with registration, when integrity problems increase, and, of course, this is the very time when user work loads tend to be high.

Although some operational reports have exception reports associated with them, many do not or the exception reports may not provide necessary information for cleanup. The greatest amount of time committed by DA on a major area of activity has been in the development of scanning programs (job streams in IBM terminology) to go through the database and output exception reports. Over thirty job streams, some are variations of others, have been developed. Not all are currently operational and new ones continue to be developed. The programming language used is Easytrieve Plus and the job streams are run in batch mode.

This work is probably similar to some work that takes place in I.S. or I.R. offices. It may differ, however, in that its focus is exclusively on data integrity rather than secondarily on it as a by-product of other reporting. It is concerned with the whole database in terms of time, not just a specific semester or period of time ,and it involves the scrutiny of actual database records and their relationships.

Much of this work continues today; in fact, it is increasing. As the database expands, not just in terms of new data, but in terms of new database records and capability, the need for these scans increases. Many now are run regularly and serve in an auditing capacity.

An ancillary activity of the data integrity work has been the documentation and standardization of procedures (some manual, some automated). Data Administration is not in the position to simply promulgate standards (DA "owns" no data); rather, it is in a position to work with users and Computer Services to coordinate and facilitate agreement on some standards and to release documentation on the agreement and the standards. Examples of this kind of work are the following: undeclared academic level, ethnicity coding, entry and academic level coding for students awaiting transfer credit evaluation and use of some code tables.

One point should be emphasized regarding data integrity scans: the work invariably produces more work from the serendipitous nature of scanning new relationships and data. Not only as a result of more data being added to the database, and the expansion of the structure of the database, but also because in a database of any size, the number of relationships is virtually unlimited (unlimited in the sense that all of them cannot be scanned and studied in a finite amount of time by one person or a few people).

The second primary area addressed by Data Administration has been policy development. Four major policy statements emerged after months of negotiation and study (Appendix A). The four policies concern user access to production data, tools and access for the mainframe, micro access to the mainframe and conditions under which users should develop micro-based systems. Concomitantly, it became apparent that an access and use agreement was needed (Appendix B). This was particularly apparent when requests for data access came from beyond the typical cadre of administrative users, e.g., academic and other users. Sometimes requestors were not aware of data sensitivity or confidentiality.

A primary effort with regard to policy development was to move the user community away from the notion of individual ownership of data and toward the notion of data being a central resource of the university. Accordingly, the user who has responsibility for input and maintenance of data is known as "the functionally responsible user." This user, however, does not approve or deny requests for access to data. Decisions on such requests are to be coordinated by Data Administration through the functionally responsible user and computer services (Policy #1).

An ongoing concern about responsibility for and standardization in reporting was reflected in Policy #4. Especially with the proliferation of micros, the number of hard copy reports increased. This policy addressed the need for identifying the user who created the report, when the report was created and where the data originated. These policies have been submitted to the Executive Council for approval.

Another area of recent DA activity, although not one of the two primary areas, has been logical database design. Practically speaking, there was no logical database design on SIS by NAU personnel. The system was designed, logically and physically, when NAU acquired it. Expansion of the structure continues, however. In the past, much of this expansion was simply coordinated by the user and programmers supporting that user. Recently, however, with an increasing awareness of the interrelationships between and within various databases, Data Administration has been able to work in the logical design of system enhancements, e.g., building and room record standardization and department code standardization. This work is more in line with much of that cited earlier in the literature review.

An area in which Data Administration has not worked to any great extent at NAU is use of the data dictionary. Although it is available and used by DA, DBA and members of the programming staff, its documentation facilities have not really been tapped. Initially, when DA was created, Computer Services was concerned about the resource impact that populating and using the data dictionary would have on the system. Also, there was concern about anyone outside of Computer Services using the dictionary. To some extent these concerns have decreased. DA has not pursued expanded use of the dictionary due to overall load. It is hoped that DA will move into more expanded use of this tool.

OBSERVATIONS:

As is true with most research projects, far more could be written about this case study than will be written. Time and reasonable length of the document do not permit exhaustive examination of DA at NAU. It is also true that other observers might write case studies of DA differently than this one. Yen points out that the purpose of a case study is not to generalize to a population or universe; rather, it is to provide a forum for generalizations to theoretical propositions (17, pg. 21). With this background in mind, the following observations are presented.

<u>Observation 1:</u>
Data Administration, created after a system is installed, is very different from Data Administration that is in on the ground floor of system development.

Virtually nothing has been written about DA initiated after a system has been installed. The literature presumes DA to be in on the logical

database design. Once the system has been designed and installed, little logical design remains, except for enhancements. Other tools also would be in use and maintained by other offices, e.g., the data dictionary by DBA.

Observation 2:
A Data Administration office initiated in a public sector institution, like a university, after a system has been acquired and installed, will commit a majority of its time to data integrity matters.

Without the acquisition of a custom made system, specifically designed for the particular institution, the policies and procedures in the code simply will not be those of the installation institution. Unless the installation institution adopts the policies and procedures reflected in the code, rewrites and modifications will be required or data integrity problems will exist. Short of having unlimited personnel resources to direct to either alternative, the institution will be in for trouble.

Observation 3:
Organizational structure and politics are critical and bear directly on the relative success of DA (6, 8, 14). This observation might be restated: In a decentralized, public sector entity, DA will be a struggle.

In a centralized, product oriented, and probably private sector entity, it would be easy for central administration to dictate the creation of DA and give it the responsibility and authority to cleanup data problems, coordinate policies, etc. In a decentralized, public sector entity like a university, an office like DA might be created and given responsibility for coordinating the cleanup of data, but the authority and resources to do the job would most likely not be there. DA at best, in any organization, is a long-term effort (14, pg. 48). In a decentralized environment, advising and liaison will be the typical activity (8, pg. 197). Gillenson states it bluntly: " ...the concept of data administration must be tailored to the technical and political realities of the individual firm" (6, pg. 319).

Observation 4:
In a decentralized, public sector entity, like a university, the concept of data being a centralized resource is basically foreign to the users and will be given reluctant commitment.

The purpose of this observation is not to say that users do not have a team spirit or are not supportive of an institutional effort. The purpose is, however, to say that in higher education there is no easily identified product around which all may rally. Without this easily identifiable product, each office or "owner of data" is responsible for doing its own thing. Each is busy and swamped with the day-to-day routine and bureaucracy. The people in each office want to do their job, and often data, or its inaccuracy, will be minimized.

Observation 5:

"Owners of data" who are accountable for it will tend to maintain it in a reasonably accurate form.

Most of the work of DA at NAU has focused on the SIS. Other systems such as Financial Aid, Housing and the Business Office have had little need for DA, except where those systems interfaced with SIS. It is suggested that the primary reason for this is that those offices are accountable for their data. If a student is not properly placed in a residence or is inappropriately billed for tuition, that student is in the respective office with a complaint that is addressed by that office. If transfer work is credited, but not to the appropriate institution, or if sex, ethnicity or birthdate are not properly entered or reported, a student will probably not be upset or even know about the error. The user office may consider this a minor error. Only an office like Institutional Research, that does studies based on raw data, may see the problem and be concerned about it.

Observation 6:
Adams said it best: "A technically successful implementation of a data base management system (DBMS) does not necessarily mean that the DBMS can be regarded as successful" (1, pg. SR/40).

This observation ties to the previous one. As far as an Institutional Research office is concerned, the system may not run well or provide reliable or valid data. Other users and Computer Services, however, may be satisfied with its implementation.

Observation 7:
In most public sector institutions, unless limits are placed on the technology, DBMS will present increasing problems in terms of data integrity as databases grow.

Contrary to popular claims, the modern DBMS technology is a double-edged sword. While it presents almost unlimited capability to identify and relate various data elements, well trained, highly paid and adequately staffed personnel are needed to run such systems. In most cases, a public sector university or college may not have the necessary resources. The alternatives, then, are to restrict the system or to accept increasing difficulties.

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APPENDIX A

DRAFT

NORTHERN ARIZONA UNIVERSITY

COMPUTER & DATA-RELATED POLICIES

1. USER ACCESS TO PRODUCTION DATA

Requests for access to production data from a user not having functional responsibility for that portion of the database will be coordinated through Data Administration. Recognizing that responsibility for the data maintenance resides with the user that has functional responsibility, Data Administration will work with that user, the requesting user and Computer Services to ensure the following:

- Appropriateness of the request.
- Completeness of data necessary to fulfill the request.
- Best usage of resources.
- Timeliness of reporting.

The Data Administrator will approve access privileges, such as read only or read and write. Write privileges will be coordinated through the user with functional responsibility and Computer Services. Requesting users will not write directly to production files. Access methods, such as flat file, batch, etc., will be coordinated through Computer Services. Extract files, created by Computer Services, will be used where possible. Users will adhere to the NAU Data Access and Use Agreement (attached).

If the basic design of the database changes, the part of this policy concerning access methods may be modified.

2. USER TOOLS FOR MAINFRAME ACCESS AND ACCESS TIMES

Production mainframe access is expected to be for report generation purposes, and Easytrieve Plus is the language recommended for use. With the exception of Data Administration and Institutional Research, use of other languages, such as COBOL, is prohibited. These two offices have mainframe programming staffs, software written in other languages, and have the need to maintain or develop new software in those languages. On Line Query (OLQ) may be used for accessing a limited number of records at a time when actual database records need to be viewed. Use of OLQ will be coordinated through Computer Services.

Program development by users for nonreporting purposes will not be supported by Computer Services. Users who wish to engage in such development may have limited machine resources. Data and files used in such development may not interact with production files and programs may not access production files.

If efficient ad-hoc query software is acquired, the part of this policy concerning tools may be modified.

3. MICRO ACCESS TO THE MAINFRAME

Micro access to the IBM 3083 is for purposes of 3270 type terminal emulation and for file transfer between the mainframe and a PC. The extent of the need for file transfer is not clearly defined, but is expected to grow. At this time, file transfer means flat file transfer from an extract (flat) file on the mainframe to a micro. Flat file transfer from a micro to the mainframe will be limited to files that are images of existing input files. The user must secure the file and assure that appropriate editing has been done prior to use by the mainframe application. Consult Computer Services.

It is known that file transfers exert a heavy load on a remote controller, and other terminals supported by that controller can be expected to experience degraded response times during a transfer. Times of transfer should be coordinated through Computer Services.

4. CONDITIONS UNDER WHICH USERS SHOULD DEVELOP MICRO-BASED SYSTEMS

Computer Services will provide a review and recommendation when users contemplate their own development. For systems with an estimated development cost exceeding $5,000.00, users must seek approval from their respective Vice President along with Computer Services' recommendation.

In general, where data are not on the mainframe and are not likely to be on it, micro-based applications can be accomplished in the user office. Where data are mainframe based, users are expected to access those data or down load them for subsequent micro processing.

A common institutional concern for standardized data exists for reports that go beyond the user office and users will adhere to the NAU Data Access and Use Agreement (attached). Reports produced by users should contain the production date on each page or a date at the end of the report. The last page should also contain the name of the responsible user office and file used for the report, if not clearly specified in the report heading. For example:

April 19, 19XX
ABC Office
Local PC file downloaded from the SIS database

APPENDIX B

DRAFT REWRITE OF 5/7/87 KRR
NAU DATA ACCESS AND USE AGREEMENT

Data stored on NAU computers is an institutional resource which belongs to the University. This data is available to qualified individuals for university-related uses. The user agrees to make responsible and ethical use of the data in cooperation with the offices which manage and maintain that data, the offices with functional responsibility.

The user should understand the some data is confidential. Other data may be sensitive and the indiscriminate use or release of such data could interfere with the function of a particular office and bring harm to the university. The user should avoid duplicate and/or uncoordinated efforts in cases where specific responsibilities have been assigned to the office which manages a particular database. Problems are unlikely to materialize in an atmosphere of common courtesy, cooperation and periodic dialog between the requesting user and the office with functional responsibility.

A university database shall be kept as current and accurate as possible. To this end, an active and qualified user will report any updates to, and in the form specified by, the user with functional responsibility. Where possible, the user will use official 21st day data.

A qualified user will adhere to the following conditions. Failure to meet these conditions can result in the loss of access to University-owned data.

1. A qualified user is a full-time employee of, or is associated with, NAU. A qualified user has been granted access and use privileges by the Data Administration Office in coordination with the office with functional responsibility (where applicable).
2. The user shall use current data and participate in keeping it up to date. Data subject to frequent change should be refreshed according to methods specified by the office with functional responsibility.
3. The user understands that no sensitive data, such as address lists or mailing labels, should be released to other parties without agreement from the office with functional responsibility. Such agreement should also be obtained where reports or publications derived from analysis of the data are to be released. No confidential data will be released to third parties.
4. The user WILL abide by guidelines provided by the Data Administration Office (in consultation with the office that has functional responsibility) and by the provisions of the Family Educational Rights and Pirvacy Act of 1974 (FERPA), also known as the Buckley Amendment.